

## CLAIMS

### What Is Claimed Is

- 1    1.    A method comprising:
  - 2                 rotating a substrate at a predefined speed, the substrate having a first surface;
  - 3                 spray coating the first surface of the substrate with a negative-tone photoresist-solvent
  - 4                 solution at angle to the first surface to obtain coverage of deep etched features, the
  - 5                 negative-tone photoresist to solvent ratio being in the range of one to three and
  - 6                 one to five and a half and having a viscosity of between one and three centipoises;
  - 7                 and
  - 8                 moving a spray nozzle across the diameter of the first surface of the substrate at
  - 9                 varying speeds to achieve a negative-tone photoresist coat of substantially the
  - 10                same thickness throughout the first surface.
- 1    2.    The method of claim 1 further comprising:
  - 2                 priming the first surface of the substrate with a primer having a water contact angle
  - 3                 between forty and fifty degrees.
- 1    3.    The method of claim 2 wherein, once primed, the photoresist can be sprayed in  
2    environments having relative humidity levels as high as sixty percent.
- 1    4.    The method of claim 1 wherein the negative-tone photoresist is a cyclohexanone-based  
2    resist and the solvent is methyl-ethyl-ketone.
- 1    5.    A method comprising:
  - 2                 rotating a substrate at a predefined speed, the substrate having a first surface;
  - 3                 spray coating the first surface of the substrate with a positive-tone photoresist-solvent
  - 4                 solution at angle to the first surface to obtain coverage of deep etched features, the
  - 5                 positive-tone photoresist to solvent ratio being in the range of one to five and one
  - 6                 to seven and having a viscosity of between one and three centipoises; and

7 moving a spray nozzle across the diameter of the first surface of the substrate at  
8 varying speeds to achieve a positive-tone photoresist coat of substantially the  
9 same thickness throughout the first surface.

1 6. The method of claim 5 further comprising:  
2 priming the first surface of the substrate with a primer having a water contact angle  
3 between forty and fifty degrees.

1 7. The method of claim 6 wherein, once primed, the photoresist can be sprayed in  
2 environments having relative humidity levels as high as sixty percent.

1 8. The method of claim 5 wherein the positive-tone photoresist is a propylene glycol  
2 monomethyl ether acetate-based resist and the solvent is methyl-ethyl-ketone.

1 9. The method of claim 5 wherein the deep etched features are deeper than 20 µm.

1 10. The method of claim 5 wherein the deep etched features are deeper than 200 µm.

1 11. A method for coating photoresist on a substrate having deep features comprising:  
2 cleaning the substrate by immersing it into a cleaning solution;  
3 rinsing the substrate in ultrapure water;  
4 thoroughly drying the substrate;  
5 priming the substrate by immersing it into a priming solution, the priming solution  
6 having a water contact angle of between forty and fifty degrees,  
7 rinsing the substrate in ultrapure water to remove excess priming solution;  
8 thoroughly drying the substrate; and  
9 spray coating the substrate with a photoresist, wherein the photoresist is sprayed at an  
10 angle to the substrate surface.

1 12. The method of claim 11 wherein  
2 the substrate is immersed into a cleaning solution of peroxide-sulfuric for five to  
3 fifteen minutes, and

4                   the substrate is rinsed in ultrapure water for five to ten minutes.

1   13.   The method of claim 11 wherein the deep features are deeper than 20  $\mu\text{m}$ .

1   14.   The method of claim 11 wherein the deep features are deeper than 200  $\mu\text{m}$ .

1   15.   The method of claim 11 wherein the priming solution has a water contact angle of  
2   between forty and fifty degrees.

1   16.   The method of claim 11 wherein, once primed, the photoresist can be sprayed in  
2   environments having relative humidity levels as high as sixty percent.

1   17.   The method of claim 11 wherein the photoresist is a negative-tone photoresist that is  
2   diluted with a solvent, the negative-tone photoresist to solvent ratio being in the range of one to  
3   three and one to five and a half.

1   18.   The method of claim 11 wherein the photoresist is a positive-tone photoresist that is  
2   diluted with a solvent, the positive-tone photoresist to solvent ratio being in the range of one to  
3   five and one to seven.